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(54) Hose protector system

(57) A hose band for reducing friction between a hose and a surface along which the hose is moved is described, having a flexible strip (11) which has a series of contact ribs (14) and flexible webs (15), and fastening means (13,17) holding the strip in position about the circumference of the hose.

The ribs and webs allow the strip to be wrapped around the circumference of the hose and the ribs hold the hose above the surface along which the hose is moved. The fastening means can be clips, bands or ties and may engage within a circumferential channel (19) on the strip.

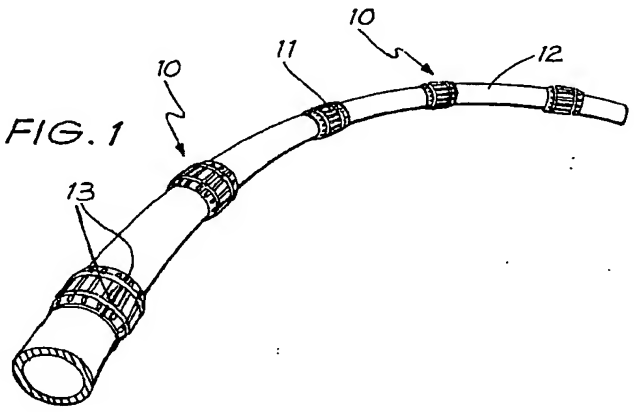

FIG. 1

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Description

BACKGROUND OF THE INVENTION

This invention relates to hose bands and more particularly to hose bands which reduce friction between the hose and the surface along which the hose is moved.

DESCRIPTION OF THE PRIOR ART

In the aircraft fuelling industry, heavy hoses often must be dragged across a tarmac. The contact between the aircraft fuel hose and the tarmac surface can create sufficient frictional resistance so as to place the hose operator at risk of back-strain injury.

Hose bands made of low friction, anti-static plastic bands or "beads" substantially overcome the problem of frictional resistance by providing point contact at suitably-spaced intervals.

A disadvantage of such prior art hose bands, which bands are moulded in two halves to suit a particular sized (diameter) hose, is that clamping and unclamping of the two halves for maintenance purposes is time-consuming. Furthermore, as wear of the bands is high, the cost of stocking and replacing the specially sized hose bands becomes significant.

SUMMARY OF THE INVENTION

The object of the present invention is to alleviate the disadvantages of the prior art.

In accordance with the present invention, there is provided a hose band for reducing friction between a hose and the surface along which the hose is moved, including a flexible strip, said strip having a series of contact ribs and flexible webs allowing said strip to be wrapped about the circumference of said hose such that said contact ribs hold said hose above said surface, and fastening means holding said strip in position about said hose circumference. The invention also relates to a method of reducing the friction between the hose and the surface along which the hose is moved by attaching to the hose one or more of said hose bands.

Preferred fasteners are either clip type which engage with the ribs at either end of the strip to hold it into a sleeve configuration, or are band type which fasten around the circumference of the sleeve. Preferably the fasteners are worm-drive circumferential band fasteners of non-sparking metals such as brass or stainless steel, or cable ties of plastic.

Preferably, the strips are formed as moulded, fluted strips of plastics in the form of thick, "wear" ribs interconnected with flexible webs, thus providing a flexible sleeve having sacrificial "wear" ribs to provide point contact with the wear surface. Preferably, the bands are applied on a length of hose at spacings apart which prevent contact of the hose skin with the wear surface under normal operating conditions.

The present invention also comprises a method for reducing friction between a hose and a surface along which said hose is moved including the step of attaching to said hose one or more hose bands including a flexible strip, said strip having a series of contact ribs and flexible webs allowing said strip to be wrapped about the circumference of said hose such that said contact ribs hold said hose above said surface, and fastening means holding said strip in position about said hose circumference.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects, features and advantages of the invention will be readily apparent from the following description of certain preferred embodiments thereof taken in conjunction with the accompanying drawings, in which:

Figure 1 is a perspective view of a hose fitted with bands according to the invention;
Figure 2 is a plan view of a stip of plastics material according to a first embodiment of the invention;
Figure 3 is a sectional view taken on the line A-A in Figure 2;
Figure 4 is a sectional view taken along the line B-B in Figure 2;
Figure 5 is an elevation of a clip fastener for use with the first embodiment of the invention;
Figure 6 is a plan view of a strip of plastics material according to a second embodiment of the invention;
Figure 7 is a sectional view taken along the line C-C in Figure 6;
Figure 8 is a plan view of a strip of plastics material according to a third embodiment of the invention;
Figure 9 is a sectional view taken along the line D-D in Figure 8.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Figure 1 illustrates hose bands according to the present invention. The hose bands are formed by strips 11 of plastics which are wrapped around a hose 12 of any diameter. The strips 11 are held onto the hose 12 by means of ties 13 and are periodically placed along the length of the hose 12 to give point contact between the surface along which the hose 12 is moved and the hose bands 10.

With respect to the above Figure and Figures 2,3 and 4, a hose band 10 is made from a fluted strip 11 of flexible, low fiction plastics material consisting of raised ribs 14 separated by thinner web regions 15. As can be seen from Figure 4, the strip 11 includes tapered regions 16 along each side to allow the band to ride over discontinuities in the surface. The strip length generally corresponds with the circumference of the hose

12. For example, a hose band 10 having seven ribs 14 is suitable to wrap around a hose 12 having a 1 inch diameter; similarly, a hose band having nine ribs is suitable for a 1.5 inch diameter hose; a twelve rib hose band, for a 2 inch diameter hose; a fourteen rib hose band, for a 2.5 inch diameter hose; a sixteen rib hose band, for a 3 inch diameter hose; a twenty-one rib hose band is suitable for a hose having a diameter of 4 inches.

Desirably, the hose bands are moulded as a strip length to suit a 4 inch hose and cut to length for smaller-diameter hoses. Preferable materials for the strip are thermoplastic materials such as high-density polyethylene (HDPE), high-density high molecular-weight polyethylene (HDHMWPE), polypropylene, or polyurethanes.

The arrangement of ribs 14 and webs 15 allows the strip 11 to be flexible so it can be wrapped around the circumference of the hose 12 and then fastened thereabouts by means of a clip 17, as shown in Figure 5.

Clip 17 is adapted to span across the seam where the ends of the strip 11 meet and has projections 18 at its ends to engage behind the ribs 14 adjacent the respective ends of the strip 11. The spacing between the projections 18 on the clip 17 will vary depending on the diameter of the hose 12.

Figures 6 and 7 illustrate a second embodiment of the invention which includes a central, circumferential channel 19 extending along the length of the strip 11 for receiving a band-type fastener such as a ratchet-type cable tie (not shown) or a worm-drive clamp (also not shown).

Figures 8 and 9 show a third embodiment of the invention in which the band-receiving channels 20 are formed on opposed sides of the strip 11 each receiving a respective band-type fastener (not shown). The fastener is tightened to form the strip 11 into a sleeve formation about the hose 12.

Maintenance of the hose installation may be achieved simply by cutting the ties 13 holding the worn sections of strip 11, rotating the strip 11 and replacing the ties 13, or replacing the word sections of strip 11 with new strips 11 and ties 13.

Claims

1. A hose band for reducing friction between a hose and a surface along which said hose is moved, including a flexible strip, said strip having a series of contact ribs and flexible webs allowing said strip to be wrapped about the circumference of said hose such that said contact ribs hold said hose above said surface, and fastening means holding said strip in position about said hose circumference.

2. A hose band according to claim 1, wherein said strip has a length substantially corresponding to said host circumference.

3. A hose band according to claim 1 or 2, wherein said ribs and said webs are transverse to said strip length.

4. A hose band according to any of claims 1 to 3, wherein said fastening means engages formations on said strip (said fastening means preferably including at least one clip which spans a seam between the ends of said strip and engages contact ribs adjacent respective ends of said strip).

5. A hose band according to claim 4, wherein said clip passes over and is retained behind said contact ribs.

6. A hose band according to claim 4 or 5, wherein said fastening means includes at least one band which engages within a circumferential channel in said strip (said fastening means preferably including a single band which engages within a central circumferential channel in said strip).

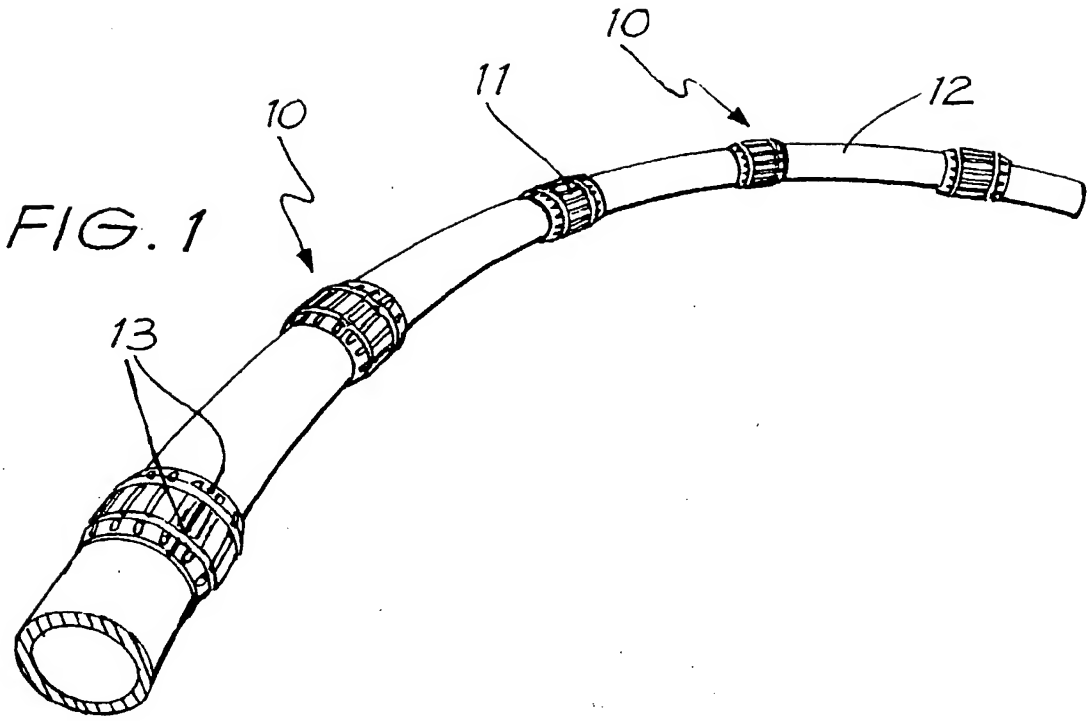
7. A hose band according to claim 6, wherein said fastening means includes a pair of bands engaging within respective circumferential channels adjacent opposite sides of said strip (the opposed sides of said strip being typically tapered).

8. A hose band according to any of claims 1 to 7, wherein said fastening means is of non-sparking metal, and/or is a worm-drive circumferential clamp, and/or includes at least one cable tie.

9. A method for reducing friction between a hose and a surface along which said hose is moved including the step of attaching to said hose one or more hose bands including a flexible strip, said strip having a series of contact ribs and flexible webs allowing said strip to be wrapped about the circumference of said hose such that said contact ribs hold said hose above said surface, and fastening means holding said strip in position about said hose circumference.

10. A method according to claim 9, wherein said hose bands are attached to said hose at intervals along said hose length to maintain said hose above said surface, and/or wherein said hose band(s) is (are) according to any of claims 2 to 8.

FIG. 1



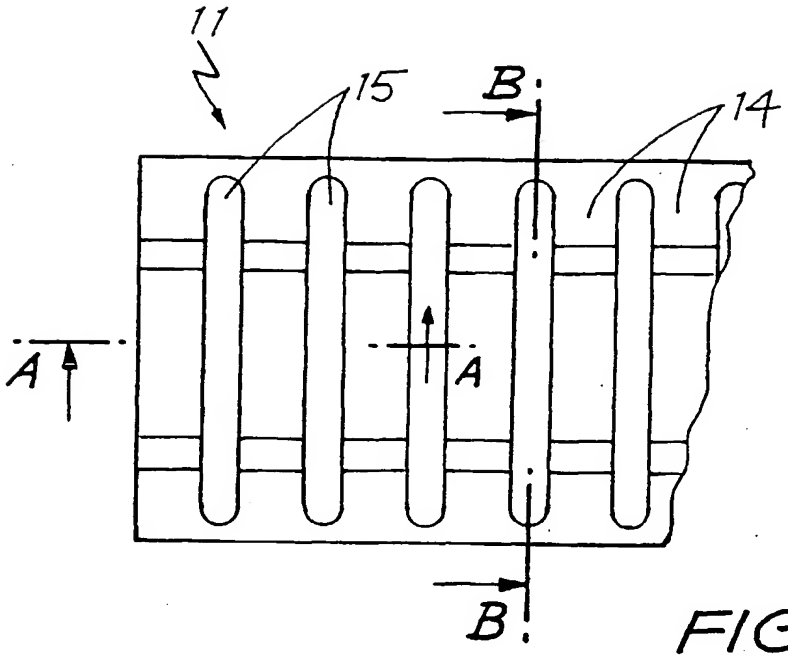


FIG. 2

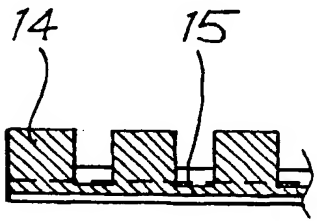


FIG. 3

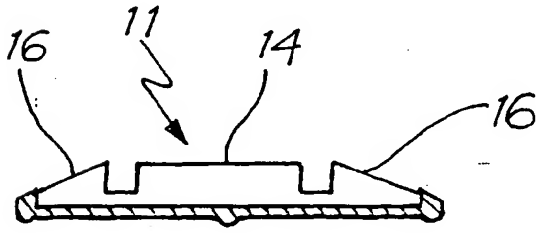


FIG. 4

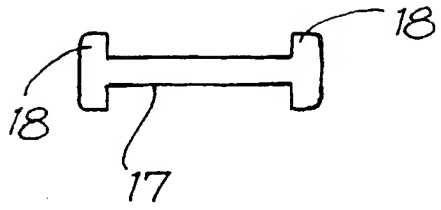


FIG. 5

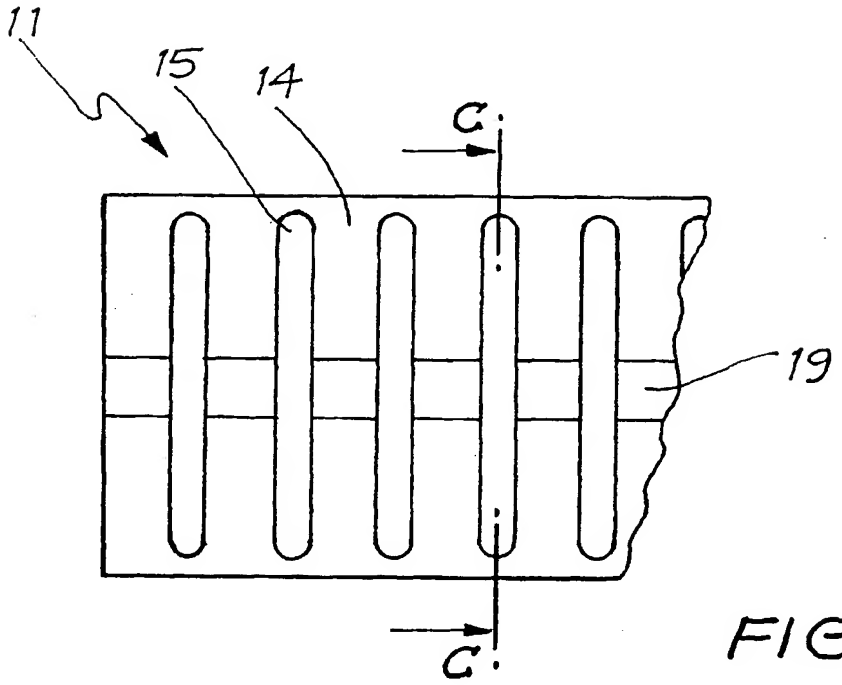


FIG. 6

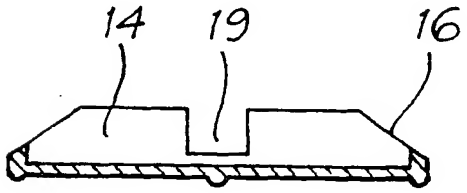


FIG. 7

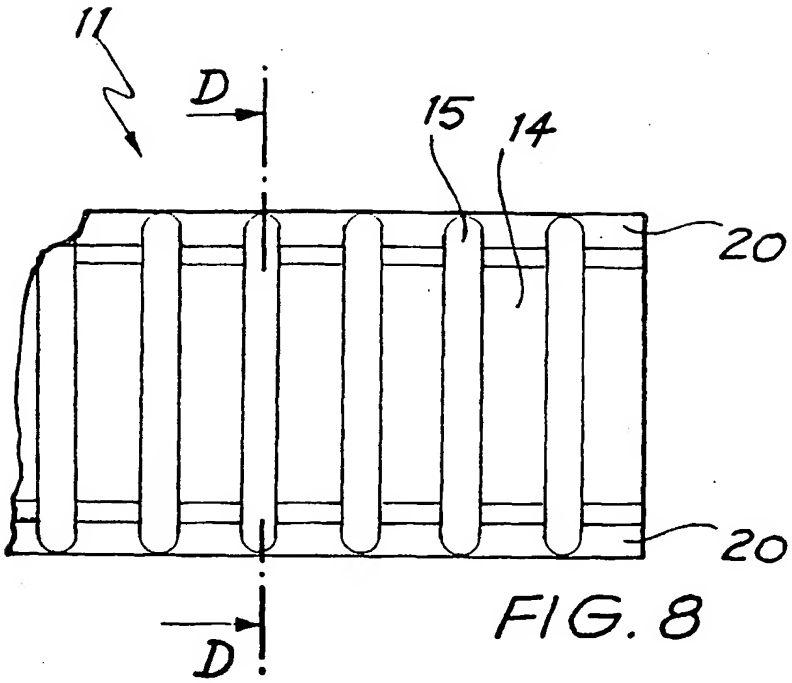


FIG. 8

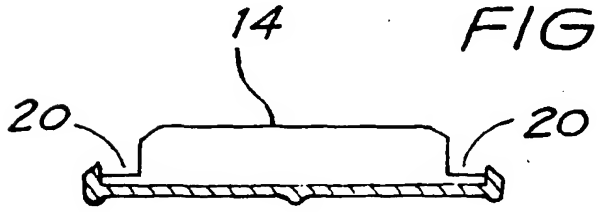


FIG. 9

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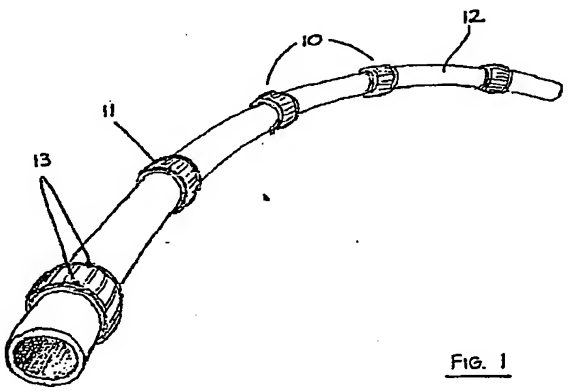

FIG. 1

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European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 98 30 4325

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	US 4 182 378 A (DIETER KURT) 8 January 1980 * column 3, line 46 - column 4, line 21; figure 1 *	1-4,8-10	F16L11/12 F16L57/00
A	* column 4, line 12 - line 21; figure 1 *	5	
Y	* column 3, line 46 - column 4, line 21; figure 1 *	6	
X	US 3 374 308 A (HAAS CARROLL J) 19 March 1968 * column 2, line 53 - line 55; figure 1 *	9,10	
Y	US 2 735 448 A (LEWIS H. PHELPS) 21 February 1956 * column 2, line 70 - column 3, line 5; figure 5 *	6	
A	FR 2 352 236 A (WEGURIT GMBH) 16 December 1977 * page 10, line 11 - line 18; figure 3 *	7	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6) F16L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	22 October 1998	Brosio, A

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
O : non-written disclosure
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